G RUSSELL DEVELOPING NEW ZX/TS PRODUCTS

Bill Russell tells SYNTAX he's creating some new products for ZX/TS machines as well as for the 2068. We can't say much at this point, but at least one will be the kind of software-hardware product that typifies G Russell efforts--like the speech recognizer.

BASIC NL SEEKS MORE MONEY

In V.1, No.4, the publishers of this Timex-Sinclair related newsletter announced their interest in "an interested party (to) merge resources for the purpose of continued growth." Elsewhere in the issue they declare a summer vacation to reformat the publication and announce that higher subscription and ad rates will take effect Sept. 1st. Basic Computer Newsletter, 3705 Biscayne Boulevard Miami, FL 33137. Mark investment proposals Harvey Abramson (confidential).

SYNCWARE NEWS REORGANIZES TO CONTINUE

Thomas B. Woods will take over publication of SyncWare News as volume 2 begins. The final arrangements call for the newsletter to go to a full-size, 16-page format with spinwriter type (like this) and remain bi-monthly. Fred Nachbaur will provide technical input, and Tom Bent will take over editorial chores. Of course the price will rise to $16.95 in North America, $22.60 elsewhere. They'll also be taking ads now. Call Tom Woods for details at 603/586-7734 (POB 64, Jefferson, NH 03583)

SINCLAIR STOPS PRODUCTION OF ZX ACCESSORIES

No more RAMpaks and ZX printers will pour off assembly lines. Even the fabled ZX81, once made at the rate of one every 10 seconds, will now be produced only to order, and then mostly for export.

K-POWER TO FULFILL TSU SUBS

Subscribers to ECC's ill-fated new venture into North America, Timex-Sinclair User, should have received postcards by now, offering K-Power to complete their subscriptions. Scholastic Magazines publishes this 64-page slick magazine, which runs Timex-specific programs, as well as covering the Adam, Apple, IBM, TI, Atari, TRS-80, VIC-20, and Commodore 64 machines. Ad rates of $6300/page limit ads from Timex-only suppliers to the very largest.

TS USER NL (YAGSEE) FOLDS

Yagsee Publishing stopped producing TS User newsletter with the Apr.84 issue. According to Derek Stubbs, Timex's exit, followed by others, left a market without new customers as old ones moved to other machines Renewals & subscriptions dropped, & YAGSEE's informal survey projected poor financial performance. But you can still buy all of vol. 2 + the 2 issues of volume 3 for just $11.95 POB 155, Vicksburg, MI 49097

SMART TERM II DELAYED

Upgraded performance for Westridge' 2050 modem will have to wait a tad longer, but we do not know quite when. The death of Stuart Lotwin seems to have thrown the company into chaos--phone calls unreturned, information unavailable, and people answering the phone who seem not to care. All of us will miss Stuart, and his rescue of the 2050 assures his place in our memories. May his family find solace in their grief.

NO NEWS ABOUT NO DEAL

No persons knowledgeable about the bulk sale of Timex inventory or any proposals from any potential buyers were available at Timex. Doug Smith verifies that all computer hardware inventory is sold, and a bulk buyer bought much of it.

SPECTRUM MC ON 2068

The Ocean State Users Group reports that they successfully entered and used Spectrum machine code programs from the UK magazine Your Computer. Blockman, I.T., Lifter, and Doom Church all went fine. Only the program to copy Spectrum programs failed. Contact Bob Dyl at 401-849-3805 (eve) for details.

LI GROUP LOADS AND MODIFIES TT

Paul Donnelly sent us the Jun.84 issue of L.I.S.T.ing, the monthly newsletter of the Long Island Sinclair Timex Group, containing full instructions for converting the Spectrum program Transylvanian Towers to operate on the 2068. TT is SAVEd as CODE, allowing you to LOAD the bytes to higher locations in your 2068 and then modify them as necessary. Reach them at 10 Idle Day Dr., Centerport, NY 11721

SYNTAX LABS LOAD SPECTRUM SOFTWARE

SYNTAX tried following the LI user group's instructions with 3 German programs from Profisoft. We could LOAD Pingo, Jangler, and Alien Curse, and locate the system variables but we did not succeed in making all the necessary changes and moving an altered program--yet.

ZILOG POLICY CHANGE

Since the ZX-80 days, SYNTAX sold Zilog manuals as a reader service. No more though, because you can now get them free by writing direct: Zilog, Inc., 1315 Del Av., Mailstop Gl-5, Campbell, CA 95008

COMPUTERS AND THE AGED

Activities, Adaptation & Aging will publish "computer technology & the aged: implications & applications for activity programs." To submit papers, call Phyllis M. Foster, Editor, at 303/794-7676.

45-PLAYER COMPUTER GAME UP IN MIAMI

American Software Technology is testing an interactive, multi-user, real-time game where you interact with other players as well as the computer. You can call Enternet at 305/866-8060 at 300 or 1200 baud. You may pay by VISA, MC, or pre-paid deposit account. Currently, the game is Fazuul, an adventure game. Your object is to escape the planet--you may team up with or against other players. You pay for the call plus 3-6 cents per minute (depending on your modem speed).

ZX SPECTRUM SOLD IN CHINA

Sinclair Research, Ltd. will sell 600 48K Spectrum computers to the computing and automation department of China's North East Technical College. According to Charles Cotton, head of Sinclair's export department: "China is a very important potential market for us, and one in which we are investing considerable time and effort. This deal represents an important stepping stone to further opportunities."

Wogen Engineering arranged the contract and also demonstrates the line of Sinclair computers at Wogen offices in Beijing and Shanghai. A consultant to the China trade, the company also maintains a London office and deals in metals, barter, and counter-purchase deals, with an emphasis on high-technology.

Sinclair will supply a library of introductory programs including microPROLOG and LOGO. Graduate researchers at the college will use the Spectrum as an effective, low-cost means of learning BASIC skills

TIMEX TECH MANUALS SHIPPED

Timex shipped its initial stock of photocopied 2068 Tech Manuals and has orders for its scheduled print run. A few orders were returned by mistake. Re-order--the print run

will be expanded. Delivery to Timex is scheduled for 15 August, so you will not get your copy until 3-4 weeks after that.

MAGGIE BRUZELIUS LEAVES SINCLAIR

Facing an offer too good to refuse, Maggie became Director of Marketing for Alpha Software (Burlington, MA) One of the few growing software houses, Alpha sells an integrated package with database, spreadsheet, word processor & communications for IBM PCs, JRs & XTs "We're steaming full ahead on business productivity software. Electric Desk is easy to use, comes on one disk, needs no extra memory & sells for only $345. It really is neat!" says Maggie.

VENDOR REPORT

Byte-Back has nearly cleared up its backlog of 2068 modem orders, but is shipping only the dumb terminal software. Jerry Minchey hopes to get the smart software out quickly, and will send the tapes in a follow-on shipment. The current version is a dumb terminal with printing capability.

Ray Kingsley of Sinware believes that some of you may have purchased bootleg copies of an early version of HOT-Z with a bug in it. Ray says he is the **only** legitimate seller of HOT-Z. If you purchased stolen goods, seek a refund from the seller and reinvest with the program owner. A simple offer to provide postal inspectors with evidence of the transaction will work wonders if you meet resistance

We received an allegation from Canada so startling that we dare not print it. Suffice it to say that Timex software does not come in baggies with photocopied documentation and brand-x tapes. SYNTAX suggests that you do no business with stores that offer you such merchandise.

NEW PRODUCTS AND SERVICES

Hawg Wild has FORTH for the 2068, deliverable now.

Electronic Specialists, Inc. offer KLEEN LINE MODEM protection, for either 4-pin (RJ-11) or 8-pin (RJ-45) modular connectors. These modules suppress both power and telephone line spikes using MOV and gas discharge suppressors. Connect between your phone line and your modem--no soldering. About $93. P.O. Box 389, Natick MA 01760 or call 1-800-225-4876.

Computer Buyers Protection Guide from Prentice-Hall covers legal differences between mail-order and store buying; pitfalls & protection of paying by cash, check or credit card; how to reject and revoke your acceptance of a computer; what a warranty covers; and effective complaining. At your bookstore. ISBN 0-13-164195-6 (CLOTH) $19.95 ISBN 0-13-164187-5 (PAPER) $12.95

Printer pedestal of welded rods can hold 100 lbs. 5 inches above table. Available for 80-column ($19.95) or 132-column ($24.95) printers. Use bottom or rear feed. (Adequate to raise monitor also.) From Zavie Enterprises, 484 Lakepark Avenue, Suite 186, Oakland, CA 94610. Or call 1-800-824-7888, op 766.

National Psychic Hotline available 24 hours via your computer and modem. No charge except for phone call. 1-707-444-9765.

Run Spectrum programs on your 2068. Snap-in kit requires no soldering, compatible with programs written for Spectrum3 and earlier ROM versions. $39.95+$3 S&H, from Phoenix Enterprises, 1780 N. DuPont Highway, #17, Dover, DE 19901 302/734-0179.

McGraw-Hill releases 3 new ZX/TS books. Beepers contains 21 electronic projects for ZX/TS machines, including IC versions of Shift Lock and one-key FUNCTION, GRAPHICS, DELETE, & EDIT circuits. Bogglers provides 22 games for the ZX/TS--some need only 2K--plus some useful appendices. GOSUBS consists of 100 subroutines to use in your programs. These include maximum, minimum, and sequence; scrolling; graphing; tables and computations. ISBN 0-07-053358-X BEEPERS $8.95 ISBN 0-07-023959-2 BOGGLERS $9.95 ISBN 0-07-022677-6 GOSUBS $9.95

MULTI-DRAW 2068, a screen drawing program for use with AERCO's parallel interface, provides a wide range of graphic and color options controlled by a joystick. String entries from the keyboard allow labels. Grey copy facility prints shades of grey for colors. You can patch BASIC programs onto this, and it includes a screen-magnify option as well as a 64-column screen copy. $24.95+$3 S&H. Knighted Computers, 707 Highland St Fulton, NY 13069. 315/593-8219.

DATASAVE--FILES WITHOUT PROGRAMS
8K/16K

DATASAVE allows you to save a selected portion of memory to tape and then load it back again to any part of memory. Loading code with DATASAVE does not (of necessity) write over the program that you are running, so a program can load data from tape, manipulate it, and then save it back to tape.

DATASAVE's machine code (MC) resides in the first REM. To make the REM, type listing 1 exactly as shown. Note that there are a total of 155 A's, and the last line of REM should have four A's.

If the Syntactic Sum checks out, RUN the program and enter the numbers from listing 2, reading left to right. When the program stops you should see a screen as in listing 3. Skip the next paragraph if the Syntactic Sum agrees with the one shown following listing 3.

LISTING 1

```
    1 REM AAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAA
   10 FOR A=16514 TO 16668    6400
   20 SCROLL                  1596
   30 PRINT A;                 371
   40 INPUT C                  460
   50 POKE A,C                 439
   60 PRINT " ";C              521
   70 NEXT A                   518
                              472
SYNTACTIC SUM:   10777, 8K ROM
```

LISTING 2--POKE TABLE

```
   0    0   205  226   64   17   203   18
 205   70   15   210  166    3    16   254
  27  122  179   32  243  205    30    3
 205  171   64   24  248  205   226   64
 205  183   64  113  205  171    64   24
 247   35  235   42   27   65    55   237
  82  235  208  225  201   14     1   219
 254  211  255   31  209  210   166    3
 213   23   23   48  242   30   148    6
  26   29  219  254   23  203   123  123
  56  245   16  245   32    4   254   86
  48  221   63  203   17   48   216  201
 205  231    2   33   25   65   205  248
  64  237   67   27   65   33    65
 205  248   64  197  225  201    34   22
  64  205   28   17  218   75    13   35
 237   91   28   64  205  245    25  235
  34   28   64  205  138   21   218  162
  27  194  182   27  201   56    21   42
  21    0    0  118    0   10    27    0
```

LISTING 3

```
    1 REM    LN  LLIST RND)ACS >LN
??ABS █( RETURN .?█4 NEXT LN 2█
LN █RND/ SAVE LN LLIST RNDLN █RN
D?LN █RND/ RUN 7 FOR E.INKEY$R G
OSUB 7 FOR SQR LPRINT TAN .█<= R
ETURN PEEK COPY 3SGN ABS █STR$
██K PAUSE 2██,1<= RETURN █ACS ??
S PRINT ( PRINT 4█ RETURN 7K<>ZA
CS )K██TAN LN SCROLL █5;INKEY$LN
  SAVE RND GOSUB 7.INKEY$5█INKEY$
LN SAVE RNDVAL LPRINT TAN 6-RNDL
N 0) AND 7$7 GOSUB 70RNDLN PLOT
; FOR 60RNDLN █+ AND █.TAB █.TAN
S+E+
   10 FOR A=16514 TO
   20 SCROLL
   30 PRINT A;
   40 INPUT C
   50 POKE A,C
   60 PRINT " ";C
   70 NEXT A
SYNTACTIC SUM:   22989, 8K ROM
```

If you have a wrong Syntactic Sum, add lines 1000-1040, shown in listing 4. RUN 1000 and check the data on the TV screen (ignoring the final five numbers) against listing 2. POKE as appropriate to correct data, or if you need major repairs, re-RUN the whole program. Now test for the Syntactic Sum shown at the end of listing 4.

```
1000 FOR N=16514 TO 16668 STEP 8
1010 FOR K=0 TO 7
1020 PRINT TAB K*4;PEEK (N+K);
1030 NEXT K
1040 NEXT N
SYNTACTIC SUM WITH LINES
1-1040:28736 8K ROM
```

Delete all line numbers except 1. The Syntactic Sum for line 1 is 18612. As a precaution, you may want to change the line number to 0 with POKE 16510,0. This prevents accidentally editing the REM. The POKE makes the Syntactic Sum 18611.

DATASAVE works much like the ZX/TS's normal SAVE and LOAD: it uses ROM calls when possible. Set your recorder as you would normally for SAVE or LOAD. No "program name" is used, so none is required to SAVE data, and the first data found during LOADing will be read.

Look at listing 5 to see how you can use DATASAVE. Variable S defines the start of your memory area to SAVE or LOAD: E sets the end. After defining S and E, you SAVE data with RAND USR 16514 or LOAD data using RAND USR 16543. Change S and E as you wish. The sample in listing 5 SAVEs and LOADs the top 1024 bytes of a 16K memory. Set RAMTOP below this area.

LISTING 5 (append these to 1 REM)

```
    5 REM SAVE TOP 1024 BYTES
   10 LET S=31744
   20 LET E=32767
   30 RAND USR 16514
SYNTACTIC SUM:   23055 8K ROM
```

Three error reports can occur when using DATASAVE:
Report 2 - S or E not defined
Report B - S or E out of range (0-65535)
Report D - BREAK depressed
When you use DATASAVE its Syntactic Sum changes. Restore it to its original value with POKE 16667,0 and POKE 16668,0.

Ron Charlton, Paducah, KY

DEAR EDITOR

I'm quite put out.

You say you're going to charge $48 for SYNTAX because of increased costs. You point out that Time Inc charges $48 for their 12-pager, and this justifies your decision.

Time's newsletters are about IBM and Apple, which cost far more than ZX/TS computers. Time will charge "what the traffic will bear"

My total costs to subscribe to ZX Computing (156pp) are $24.33 for six issues & Sinclair User (148pp) costs only $43.56 for 12 issues.

Why should we pay you $48 for 12 twelve-page newsletters?

John Sampson, College Pt. NY

John, I personally talked to Time's newsletter publisher about your point. Not so. The traffic would have borne far more--$48 is the lowest price Time considered.

You pay $48 for value. Here's what 7 survey respondents said about the value they've received.

"As a newcomer to computers 2 years ago, I needed all the help I could get and found that SYNTAX (recommended to me by a freind) pointed the way to a lot of places I would not have found otherwise."

"I appreciate your avoiding the high gloss and continuing with high quality instead."

"It is virtually impossible to assign a dollar value to your publication, but some of the explanations and examples in your articles helped me to get my present job, which is obviously worth a great deal to me."

"I learned a tremendous amount from SYNTAX & to date I've learned more about computers from SYNTAX per $ spent than any other computer publication I have bought."

"Each good item is worth the price of that month's issue."

"Please do eveything possible to continue publication. I would happily pay 2-3 times the price if

needed to cover lost income from faint-hearted supplier's and manufacturer's advertising."

SYNTAX is going the way of the dodo it will not emulate the phoenix. Anyone who has nerve to charge $48 a year for the junk that has been printed in the past nine months deserves to fold. If you had a decent newsletter that would attract advertisers there would be no need for a 70% increase.

Clifford Efaw, Morton, WA

Courage is the most important virtue. Without it, no other can be consistently practiced.

Ex-advertisers owe SYNTAX and SQ $22,690.10--and we switched to pre-pay in Jan.83! All companies on the Apr.84 list were asked to advertise, you see the results.

Those who get $48 in value from SYNTAX should have the chance to keep on getting it--KO.

InfoWorld's news page carried a report about TimeStar and the Timex Sinclair Computer. Synchro-Sette carried a similar artcle in March. Your publication was quick to denounce such reports as unfounded rumor, and even to assert that Timex was not negotiating or had received no proposals. It seems interesting that the last major publication for Timex Sinclair Computers can not find out information that a magazine like InfoWorld is able to obtain.

It seems to many of us that you would better serve your own interests, as well as your readers, if you would investigate this possibilty fully and encourage Mr. Higgenbach (sic) instead of throwing cold water on such a possible deal.

Lonnie Kendall, Reidsville, NC

I believe in the stance taken by news stories in SYNTAX--KO.

Programmers who want to alter the Westridge Modem software for ZX/TS machines must first POKE some locations in the REM line to avoid crashes. Here's how:
LOAD the TS1000 software.
At the 0/0 report, type:
    POKE 16529,149
    POKE 16530,14
    POKE 20264,118
Now you can add BASIC lines.

The authors of the modem software altered the pointers defining the length of the REM holding the code. Thus, when a user tries to add additional lines, the program crashes. The POKES correct these pointers and place a 118 (ENTER) at the end of the line. When the computer sees this line properly, new lines can be added.

Also, Westridge uses port 115d for data and port 119d for control of the 8251 serial chip inside.

Thomas B. Woods, Jefferson NH

Is there a way to reset ZX/TS computers and retain the contents from 16k-RAMTOP after a crash?

Also, where will I find ways to use extra keys to get shifted functions or FUNCTION operations with single keystrokes?

Bill Jones, Panama City FL

SYNTAX knows of no simple way to alter the reset scheme to save the main memory area. Also, it might do no good to do so--how will you know the state of the machine?

You add shifted key functions with diodes (SQ Winter 82 p.29) or ICs (Mar.81 p.7) or double-pole switches (Jan.83 p.10). To do the functions, you need 2 keystrokes-- one to shift mode, the second to select the specific operation. You build the mode selector as shifted enter or 9, then use either the primary key or a specially marked one to make the second stroke. McGraw-Hill's new book, Beepers, shows an opto-isolator scheme for functional keys & a CAPS lock--KO.

I am surprised that you stated that there was a bug in my COMPILER when I also sent you a correction to that bug. The correction probably did not arrive in time for publication, but please print that **the bug has indeed been corrected.**

The review placed very little emphasis on the ability of COMPILER to handle strings and very little was mentioned of the Z80 ASSEMBLER that comes with COMPILER.

I think most readers will be pleasantly surprised if they buy the compiler. It is not as user-unfriendly as you make it seem For one thing, you can run most programs in BASIC prior to compiling This helps to de-bug programs.

I don't know what you mean by "display poor"....

John Richard Coffey, JRC Software
Scottsburg, IN

Your correction arrived on 5 July, the issue was already on press. We review the product we have, not the one the supplier promises. SYNTAX reviews only production versions of products. As you say, there was a bug. Years ago KO heard Dr. Harlan Mills of IBM say there is no formal proof that the last bug has been found--you can never know your code is bug-free unless you use methods that generate bug-free code. Most experienced programmers know "where there's one, there are many."

SYNTAX reviewed only COMPILER, as the first and last paragraphs of the review emphasize. We therefore have no comment on the assembler other than to note that you sent us 2 corrections to that program, too.

Most does not mean all. If my program doesn't run, how do I know if it's my mistake or yours? Our program ran in BASIC, but not after compiling. If we use one of your non-standard BASIC constructs and it fails to run, what then?

"Display: Poor" means error messages just print on the screen without formatting or organization.

7

LINESUM--8K/16K

Locating errors made in typing from printed listings is easy when they include a checksum for every statement, and you have Linesum loaded. It displays, line by line, any BASIC present with line numbers below 9000, & displays the sum of the line's bytes. Add the line sums to get Syntactic Sum.

Linesum's flexibility surfaces with use. You LOAD Linesum first, then after typing in a program line you RUN 9000 & use the edit option to fix errors or type another line before returning to Linesum. That way you check every program line as you type it. Use the quit option to free the computer to calculate, and reenter Linesum at the point you left it by typing GOTO SUM.

Long programs may be finished piecemeal: if you tire, "quit" & SAVE your partial program. LOAD it later & take up where you left off. If you get an inspiration and want to try a BASIC routine while it's fresh in your mind, do it. Lines 9536-999 are your work area. Don't even clean up: test programs in this area vanish when you erase Linesum. With a merge utility, you can type your new program, and only append Linesum if the Syntactic Sum indicates you have made a mistake.

Once you start Linesum do not use RUN until you are all finished with Linesum. Do GOTO SUM instead to avoid killing variables.

To make your copy, LOAD your Syntactic Sum tape, then type in Linesum. Don't type the checksums or the GRAPHICS 5, they aren't part of the program. Syntactic Sum at this point equals 35581. If you get a different number, find and correct any typing errors. Put your ZX/TS in FAST, then SAVE this version to a scratch tape.

Next, RUN Linesum on itself, verifying each line in turn. The Print option stops at each line-- the Lprint option runs by itself.

Add 1 REM with 22 placeholders

```
1 REM 12345678901234567890123456789012
```

Next, RUN 9505, to load the MC (machine code) into the Line 1 REM. Enter all numbers on the POKE list, then a STOP to exit the loader. EDIT Line 1 to line number 9490.

```
 33   40   35  205  216    9   35   35
 35  235   42   12   64  167  237   82
235   27  114   43  115  201
```

Now edit line 9325, changing 9999 to 9000. Linesum will no longer work on itself, but only on program lines below 9000. The new Syntactic Sum will be 38824. RUN linesum to get the result shown:

```
 1 REM 5C7LN **▓777 FOR E£RND▓
 GOSUB ? FOR .7F?TAN       ▓2594
SYNTACTIC SUM:  2594, 8K ROM
```

Delete line 1. SAVE the program to tape for future use. At this step, Syntactic Sum is 36230.

Leave Linesum loaded and type in the program "DATASAVE" shown on page 5 of this issue. You won't be able to get a correct Syntactic Sum using the standard Syntactic Sum program now, as Linesum is also present, so do RUN 9000.

Now you can step through the typed-in program 1 line at a time. When the displayed checksum differs from the printed one, use the edit option to switch to normal BASIC listing at the current line. Find & EDIT the error, then do GOTO SUM to go back to Linesum for a display of the edited line and new checksum

After everything is fixed and your line checksums agree with the printed ones, you reRUN, using the LPRINT option to get a LISTing with linesums and the Syntactic Sum.

```
9000 REM "LINESUM" DISPLAYS A PR
OGRAM ONE LINE AT A TIME, ALONG
 WITH THE CHECKSUM OF ITS BYTES.
                           ▓3865
9005 REM                    ▓434
9010 REM IF THE CHECKSUM REVEALS
ENTRY ERROR THE CURRENT LINE CAN
BE EDITED, AND THEN RE-CHECKED.
                           ▓3968
9015 REM                    ▓444
9020 REM ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
                           ▓674
9025 REM ▓DO NOT USE RUN AFTER ▓
                           ▓1423
9030 REM ▓   AN EDIT OPERATION. ▓
                           ▓1368
9035 REM ▓   RE-ENTER LINESUM BY ▓
                           ▓1444
```

```
9040 REM ▮THE COMMAND GOTO SUM ▮
                                       1465
9045 REM ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
                                       3507
9050 REM                               479
9055 FAST                              479
9060 REM THE ENTIRE LINESUM PRO-
GRAM FROM LINE 9900 UP CAN BE
ERASED BY THESE TWO COMMANDS:
                                       3748
9065 REM <<GOTO 9485>>                 924
9070 REM <<9000 ENTER>>                955
9075 LET SUM=9135                      1309
9080 PRINT "(P)PRINT (L)LPRINT (
Q)QUIT"                                1613
9085 PAUSE 4E4                         999
9090 LET K$=INKEY$                     676
9095 IF K$<>"P" AND K$<>"L" AND
K$<>"Q" THEN GOTO 9085                 3193
9100 IF K$="P" THEN LET FL=0
                                       1448
9105 IF K$="L" THEN LET FL=1           1579
9110 IF K$="Q" THEN CLS                1193
9115 IF K$="Q" THEN LIST 9000
                                       1758
9120 LET CA=16509                      1348
9125 LET TOT=0                         912
9130 LET LA=CA                         756
9135 LET CA=LA                         781
9140 IF FL=0 THEN LET K$="P"
                                       1488
9145 LET LSUM=0                        980
9150 LET L$=""                         695
9155 LET NA=CA+PEEK (CA+2)+256*P
EEK (CA+3)+4                           2887
9160 LET L$=L$+STR$ (256*PEEK CA
+PEEK (CA+1))                          2363
9165 IF LEN L$<4 THEN LET L$=" "
+L$                                    1850
9170 IF LEN L$<4 THEN GOTO 9165
                                       2132
9175 LET LSUM=LSUM+PEEK CA+PEEK
(CA+1)+PEEK (CA+2)+PEEK (CA+3)
                                       3435
9180 LET CA=CA+4                       1115
9185 LET BV=PEEK CA                    1034
9190 LET LSUM=LSUM+BV                  1203
9195 IF BV=118 THEN GOTO 9235
                                       2194
9200 IF BV<>126 THEN GOTO 9220
                                       2349
9205 LET LSUM=LSUM+PEEK (CA+1)+P
EEK (CA+2)+PEEK (CA+3)+PEEK (CA+
4)+PEEK (CA+5)                         4518
9210 LET CA=CA+6                       1211
9215 GOTO 9185                         1206
9220 LET L$=L$+CHR$ BV                 887
9225 LET CA=CA+1                       900
9230 GOTO 9185                         966
9235 CLS                               426
9240 PRINT L$;                         515
9245 LET C=33-PEEK 16441               1607
9250 LET R=24-PEEK 16442               1689
9255 IF C<31-LEN STR$ LSUM THEN
GOTO 9265                              2690
9260 LET R=R+1                         887
9265 PRINT AT R,31-(LEN STR$ LSU
M);"▮";LSUM;                           2187
9270 IF FL=1 THEN GOTO 9430
                                       1839
9275 PRINT AT 19,0;"CHOOSE: (N)N
EXT LINE   (Q)QUIT   (E)EDIT CURR
ENT PROGRAM LINE"                      3549
9280 PAUSE 4E4                         939
```

```
9285 LET K$=INKEY$                     616
9290 IF K$="Q" THEN CLS                1118
9295 IF K$="Q" THEN LIST 9000
                                       1683
9300 IF K$="E" THEN CLS                1116
9305 IF K$="E" THEN LIST 256*PEE
K LA+PEEK (LA+1)                       2475
9310 IF K$<>"N" THEN GOTO 9280         1747
9315 LET TOT=TOT+LSUM                  1094
9320 IF TOT>65535 THEN LET TOT=T
OT-65536                               2819
9325 IF 256*PEEK NA+PEEK (NA+1)>
=9999 THEN GOTO 9340                   3742
9330 LET CA=NA                         703
9335 GOTO 9130                         1096
9340 CLS                               531
9345 IF FL=1 THEN LET K$="S"
                                       1571
9350 IF FL=1 THEN GOTO 9395            2044
9355 PRINT "FINAL PROGRAM LINE E
XAMINED."                              1752
9360 PRINT AT 19,0;"CHOOSE: (Q)Q
UIT (S)SYNTACTIC SUM"                  2669
9365 PAUSE 4E4                         1024
9370 LET K$=INKEY$                     701
9375 IF K$="S" THEN GOTO 9395          1828
9380 IF K$<>"Q" THEN GOTO 9365
                                       1909
9385 IF K$="Q" THEN CLS                1213
9390 IF K$="Q" THEN LIST               1207
9395 CLS                               586
9400 PRINT "SYNTACTIC SUM:    ";TO
T;", 8K ROM"                           1770
9405 IF FL=1 THEN GOTO 9430            1974
9410 IF FL=0 THEN PRINT AT 19,0;
"PRESS ANY KEY TO LIST 9000"
                                       3163
9415 PAUSE 4E4                         1074
9420 CLS                               611
9425 LIST 9000                         1176
9430 LET L$=""                         720
9435 LET DFA=PEEK 16396+256*PEEK
 16397+1                               2855
9440 LET END=PEEK 16398+256*PEEK
 16399                                 2571
9445 IF DFA=END THEN GOTO 9470         2055
9450 IF PEEK DFA=118 THEN GOTO 9
460                                    2566
9455 LET L$=L$+CHR$ PEEK DFA
                                       1359
9460 LET DFA=DFA+1                     1225
9465 GOTO 9445                         1220
9470 LPRINT L$                         699
9475 IF K$="S" THEN STOP               1026
9480 GOTO 9315                         966
9485 RAND USR (PEEK 16425+256*PE
EK 16426+5)                            2900
9490 REM <<MACHINE CODE ROUTINE
GOES IN THIS LINE>>                    2056
9495 CLS                               431
9500 LIST 9000                         996
9505 LET CA=16514                      974
9510 PRINT "ENTER DEC CODE"
                                       1023
9515 INPUT K                           487
9520 POKE CA,K                         605
9525 LET CA=CA+1                       945
9530 CLS                               466
9535 GOTO 9510                         1033
SYNTACTIC SUM:  35581, 8K ROM
```

When you finish, erase the entire Linesum program above 9000 using: GOTO 9485 & 9000 ENTER.

Linesum is menu-driven with 3 options after each line display: Next Line, Quit, or Edit Current Line. At the beginning, you choose screen or printer output. At the end of a screen session you can examine the Syntactic Sum.

Lines 9485-500 erase Linesum. Line 9485 gets the address of the next line. The relocatable machine code routine in line 9490 computes the Linesum program length (from 9000 to the end of BASIC program area) and stores this number minus 4 in the text length bytes of line 9000. When you delete line 9000, all of Linesum disappears.

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